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iRequire: Gathering End-User Requirements for New Apps

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Abstract—**Mobile devices such as Smartphones and Internet Tablets have become an integral part of our life. We can install applications providing various functionalities. Our research focuses on an application which enables end-users to blog requirements in situ. The gathered end-user needs can be seen as a starting point for the development of applications and the evolution of mobile platforms.**

Keywords-end-user involvement; requirements elicitation; requirements blogging; mobile computing; context detection

I. INTRODUCTION AND MOTIVATION

Researchers highlight the end-user's involvement in software engineering as an important concept for developing useful and usable systems [1], [2], [3]. However, end-user involvement is still a delicate issue [1]. Novel paradigms such as ubiquitous and service-oriented computing strengthen the need for more active end-user involvement in order to provide personalized systems that are tailored to individual end-user needs. Our research is based on the fact that the majority of end-users are equipped with mobile devices such as Smartphones and Internet Tablets and that they use an increasing number of mobile applications. A mobile RE tool can be just one of many applications installed on end-users' mobile devices. Such an approach can turn mobile devices into RE tools and would strengthen more active involvement of end-users in software engineering.

In [4] we have initially reported on a mobile RE tool which supports end-users to blog their needs in-situ. This early prototype named iRequire has been used in a first experiment that highlighted its potential. End-users were able to document initial requirements descriptions themselves while performing everyday tasks. Furthermore, requirements engineers were able to understand captured end-user needs and to transcribe them into well-defined requirements descriptions [5].

Together with Samsung, we have now developed a more sophisticated iRequire tool available for Samsung's bada platform. The current tool prototype provides an improved user interface and first tests revealed its reliability. While the early iRequire prototype (which is available for Windows Mobile) was not capable of sending documented needs to a receiver, the novel bada iRequire is able to do so. We foresee that end-user needs sent to receivers such as Samsung will stimulate the development of new applications and platform evolution.

II. THE bada iREQUIRE TOOL

The bada iRequire tool was developed from the results of usability and utility evaluations of the first iRequire prototype for Windows Mobile. Among other issues these studies revealed that using a start screen – where end-users had to manually press a button to continue – was considered to unnecessarily slow down the documentation process. Furthermore, end-users criticized the poor look-and-feel of the early prototype.

We developed the novel bada iRequire prototype in cooperation with Samsung. Similar to the first iRequire prototype, bada iRequire enables end-users to blog their requirements via a wizard-like user interface which provides step-by-step guidance. More specifically, there is a four-step wizard for documenting a need. In each step iRequire provides instructions for end-users (e.g. Please express your need using audio or text). After documenting the requested information, end-users tap the next button to proceed. Following iRequire's idea of a flexible elicitation process, the tool enables end-users to skip any of the proposed elicitation steps. The wizard also allows end-users to go back to previous steps.

The bada iRequire prototype provides the following features that support end-users in capturing and communicating their needs:

Capturing contextual information: As a first step, bada iRequire invites end-users to capture contextual information. The tool uses the built-in camera of the smartphone and enables end-users to take a picture of surroundings or objects which are related to their needs. First iRequire evaluations have revealed that pictures support analysts to better understand the situation of the end-users and their documented need. However, just taking a picture of relevant objects does not enable end-users to express needs. For example, the screenshot shown in Figure 1 depicts *people having coffee*, which only provides limited information.

Documenting the need: In a next step bada iRequire allows end-users to blog their individual needs and ideas. The tool provides two options to document ideas. End-users can blog their needs with the help of text-based requirements descriptions and audio recordings (see Figure 1). We provide both options as studies have revealed that entering text in situ using a (virtual) keyboard is not always comfortable [6]. As audio recording sometimes is the more suitable choice iRequire provides a dictaphone-like audio recording feature allowing the quick documentation of upcoming ideas and

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requirements. The bada iRequire tool limits textual descriptions and audio recordings to a maximum number of characters and a maximum recording time (see Figure 1). This supports requirements analysis; it also prevents wordy and excessive descriptions of needs. An example for an end-user need documented with bada iRequire could be the following request: *I would like to invite friends for a coffee at the push of a button.*

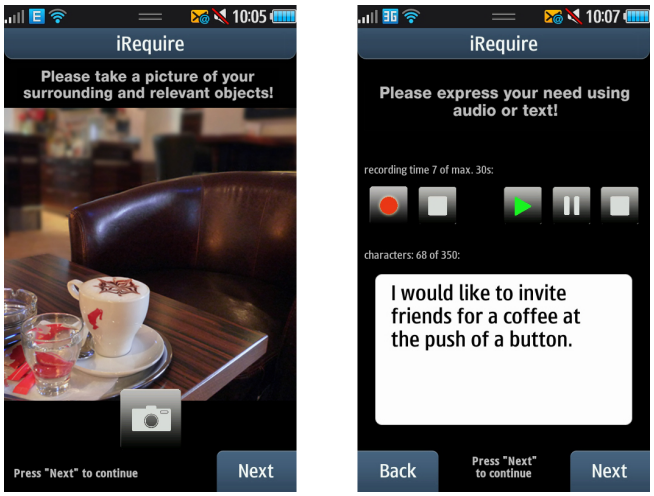

Figure 1. Taking a picture of the environment (left) and documenting a need (right) using bada iRequire

Describing the relevant task and providing the rationale: In the following step, end-users are able to describe which tasks or activities will be supported by a documented need. Furthermore, end-users are requested to explain why the documented need is important to them by providing a rationale. This feature is similar to the description of needs – end-users can document the requested information using textual descriptions and audio recording. A possible task and rational description regarding the above-described need could be: *Inform my friends that I am here at the café. I do not want to give all my friends a call because this takes too long.*

Reviewing the summary and submitting the need: For the last step, end-users are requested to review the documented information. The bada iRequire tool displays the captured picture and the entered textual information to end-users. Furthermore, end-users are able to listen to the attached audio recordings. After the final review, end-users are asked to send the captured need to a predefined receiver.

While end-users are documenting needs, the bada iRequire tool automatically captures contextual information about the end-user's environment (e.g. GPS data). The automatic context-sensing feature enables the bada iRequire tool to describe more precisely the environment in which a need was captured without requiring user input. This contextual information is stored and sent together with the need to the predefined receiver.

III. Conclusion and Future Work

This paper presents bada iRequire, a mobile RE tool for end-users which allows them to capture needs themselves and in situ. The tool was developed in cooperation with Samsung and is available for the bada platform. The bada iRequire tool overcomes the limitations of the first iRequire prototype – which was developed to initially investigate the potential of using mobile RE tools to strengthen end-user involvement in software engineering.

We foresee that bada iRequire will enable end-users to continuously document their needs in situ and to communicate these needs to authorized and responsible receivers. One possible and envisioned scenario is that end-users communicate their needs and ideas to platform providers such as Samsung. Such a mechanism will enable platform providers to plan their activities according to end-user needs; this might result in providing new requested applications and features and, more generally, it might hasten the evolution of an end-user driven platform.

With the help of the bada iRequire tool we are conducting (and plan to continue conducting) more sophisticated evaluation studies to explore in more detail the potential of mobile RE tools for end-users. We are focusing on long-term evaluation studies to better understand when and where end-users document and communicate needs. It is highly important to investigate the prerequisites that end-users will provide – needs, motivation, privacy and legal concerns regarding continuous requirements communication. Furthermore, we are interested in the quality and relevance of the communicated needs. More specifically, we plan to see if Samsung and other mobile application providers will benefit from this approach. We also consider investigating issues which might arise in the context of applying mobile RE tools. For example, end-user's privacy concerns might limit the applicability of our work. We foresee the provision of more sophisticated tool features to mitigate this issue and to enable end-users to decide which information is communicated to e.g. a platform provider.

References

[1] S. Kujala, M. Kauppinen, L. Lehtola, and T. Kojo, "The role of user involvement in requirements quality and project success," Proc. International Requirements Engineering Conference (RE'05), 2005, pp. 75-84.

[2] A. Wilson, M. Bekker, P. Johnson, and H. Johnson, "Helping and Hindering User Involvement –A Tale of Everyday Design," Proc. Conf. on Human Factors in Computing Systems, 1997, pp. 178-185.

[3] H. Barki and J. Hartwick, "Rethinking the concept of user involvement," MIS Quarterly, vol. 13(1), 1989, pp. 53-63.

[4] N. Seyff, F. Graf, and N. Maiden, "End-User Requirements Blogging with iRequire," Proc. IEEE/ACM International Conference on Software Engineering (ICSE'10), 2010, pp. 285-288.

[5] N. Seyff, F. Graf, and N. Maiden, "Using Mobile RE Tools to Give End-Users Their Own Voice," Proc. International IEEE Requirements Engineering Conference (RE'10), 2010, pp. 37-46.

[6] N. Seyff, N. Maiden, I. K. Karlsen, J. Lockerbie, P. Grünbacher, F. Graf, and C. Ncube, "Exploring how to use scenarios to discover requirements," Requirements Engineering, vol. 14(2), 2009, pp. 91-111.